

### **REMARKS**

Claims 1-31 are currently pending in the subject application and are presently under consideration. Claims 1, 12, 20 and 21 have been amended as shown on pages 2-5 of the Reply. Claim 31 has been withdrawn.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

#### **I. Restriction Requirement**

The Examiner requires restriction to one of the following two groups of claims under 35 U.S.C. §121:

Group I – Claims 1-30, drawn to lock hierarchy arrangement wherein upon release of all child locks associated with a parent, then such parent lock is also released, classified in class 707, subclass 104.1.

Group II – Claim 31, drawn to file protection system during performance of concurrent transactions, classified in class 707, subclass 204.

As discussed with Examiner in a phone conversation on October 6, 2006, applicants' representative hereby elects with traverse Group I (Claims 1-30) for further prosecution on the merits.

#### **II. Rejection of Claims 1, 12, 20, 21 and 26 Under 35 U.S.C. §101**

Claims 1, 12, 20, 21 and 26 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. The Federal Circuit has clearly established in *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 1325, 1338 (Fed. Cir. 2005) and *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed.Cir. 1999) that inventions such as that claimed by applicant is statutory.

This court must also decide whether software code made in the United States and exported abroad is a "component of a patented invention" under 271(f)... Section 271(f) refers to "components of a patented invention"... Title 35, section 101, explains that an invention includes "any new and useful process, machine,

manufacture or composition of matter."... Without question, ***software code alone qualifies as an invention eligible for patenting under these categories***, at least as processes. *Eolas Techs., Inc. v. Microsoft Corp.*, 399 F.3d 1325, 1338 (Fed. Cir. 2005). (Emphasis added).

The Federal Circuit in *Eolas Techs., Inc. v. Microsoft Corp.* clearly established that software code alone is statutory subject matter. Independent claim 1 20 and 26 recite a ***computer implemented ... system***. A system by itself is statutory subject matter. By the standards set forth in the above decision, a computer implemented system in the form of software, hardware, or the combination of both clearly falls within the categories of statutory subject matter. Independent claims 12 and 21 recite a ***computer implemented method*** and by the same standard as set forth above, this claim falls within the categories of statutory matter. Moreover, independent claim 26 recites a ***computer-readable medium having stored thereon a data structure***

Furthermore, the subject claims produce a useful, concrete, and tangible result.

Because the claimed process applies the Boolean principle [abstract idea] ***to produce a useful, concrete, tangible result*** ... on its face the claimed process comfortably falls within the scope of §101. *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1358. (Fed.Cir. 1999) (Emphasis added); *See State Street Bank & Trust Co. v. Signature Fin. Group, Inc.*, 149 F.3d 1368, 1373, 47 USPQ2d 1596, 1601 (Fed.Cir.1998). The inquiry into patentability requires an examination of the contested claims to see if the claimed subject matter, as a whole, is a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea," or if the mathematical concept has been ***reduced to some practical application rendering it "useful."*** *AT&T* at 1357 *citing In re Alappat*, 33 F.3d 1526, 31 1544, 31 U.S.P.Q.2D (BNA) 1545, 1557 (Fed. Cir. 1994) (Emphasis added) (holding that more than an abstract idea was claimed because the claimed invention as a whole was directed toward forming a specific machine that produced the useful, concrete, and tangible result of a smooth waveform display).

The claimed invention produces a useful, concrete, tangible result relating to database systems and the control of the function of locking to ensure that the lock acquired by a process is

released after completion of that process. Independent claims 1, 12, 20, 21 and 26 recite similar limitations, namely *a lock manager that acquires a parent lock and a child lock on resource(s) of a database, the parent lock has a reference count of the child lock, and the parent lock is released upon release of child locks associated therewith.*

In the Office Action dated October 11, 2006, the Examiner contends that the subject invention is merely abstract ideas with no specific result to define a useful, concrete, and tangible result. Applicant's representative respectfully avers to the contrary. In more detail, the invention as claimed controls the locks by defining a parent-child relationship among the plurality of locks in a lock hierarchy, reference counting a child lock associated with a parent lock and releasing a parent lock upon release of all the respective child locks associated. The events recited in the subject claims relate to *locking and unlocking resources in databases* to ensure that data one application is modifying is not simultaneously modified by another application or process, and are not abstract ideas. Consequently, real world stored data is being manipulated by the subject invention and the locking and unlocking of resources in a database can prevent data corruption. The results facilitated are useful, concrete and tangible.

In view of at least the foregoing, it is readily apparent that the invention as claimed produces a useful, concrete, tangible result. Accordingly, it is respectfully requested that the rejection be withdrawn.

### **III. Objection of Claims 19 and 25 Under 37 CFR 1.75(c)**

Claims 19 and 25 stand objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. This objection should be withdrawn in view of claims 19 and 25 being cancelled.

### **IV. Rejection of Claims 1, 5-21 and 25 Under 35 U.S.C. §102(b)**

Claims 1, 5-21 and 25 stand rejected under 35 U.S.C. §102(b) as being anticipated by Chan *et al.* (US 6,108,654). Withdrawal of this rejection is requested for at least the following reasons. Chan *et al* does not teach or suggest all the features of the subject claims.

A single prior art reference anticipates a patent claim only if it *expressly or inherently describes each and every limitation* set

forth in the patent claim. *Trintec Industries, Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); *See Verdegaaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ***The identical invention must be shown in as complete detail as is contained in the ... claim.*** *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants' claimed invention relates to supplying a database with a parent-child lock hierarchy arrangement, such that each lock contains sufficient information to determine its own lifetime. In particular, independent claim 1 recites *a computer implemented database management system comprising a lock manager that acquires a parent lock and a child lock on resource(s) of a database, the parent lock has a reference count of the child lock, and the parent lock is released upon release of child locks associated therewith*. Independent claims 12, 20 and 21 recite similar limitations. *Chan et al.* does not teach or suggest such novel aspects of applicants' claimed subject matter.

*Chan et al.* relates to finer-grained dynamic allocation and de-allocation of locks in a system, while protecting against abnormal termination that may result in data integrity problems. At page 5 of the Office Action, the Examiner asserts that *Chan et al.* teaches a lock manager that acquires a parent lock and a child lock on a resource of a database, the parent lock has a reference count of the child lock. Applicants' representative disagrees. At the cited portions, the cited reference teaches a lock manager that manages and controls the allocation of locks in a system. In a distributed system, each node in the system has its own instantiation of a distributed lock manager, so the locks allocated for processes in each node, is managed by the lock manager of that node. So even if the nodes are translated to have root/parent node and leaf/child node, the cited reference does not teach that when the child node acquires a lock, the parent node also acquires a corresponding lock where the parent lock covers the child operation, and hence is silent regarding ***a lock manager that acquires a parent lock and a child lock on resource(s) of a database where the parent lock has a reference count of the child lock.*** Further, at the cited portions, the cited reference teaches recovery domains. When a node abnormally terminates, the lock manager cleans up after the dead processes by setting a persistent resource object in a dubious state, to avoid data invalidity. Each lock manager instance on a distributed node maintains recovery domain objects including a reference count of local processes currently

attached to the recovery domain. After recovery is initiated, as a process detaches from the recovery domain, the reference count is decremented, and when there are no more processes attached, all persistent resources are de-allocated and recovery domain data objects are released. Thus, the recovery domain data objects taught by the cited reference are data objects stored by each lock manager instance on a distributed node when a node abnormally terminates. All nodes that are affected by the dubious domain mark it for recovery, and after the recovery has been processed the lock on that domain is cleared. Nowhere does the cited reference teach *the parent lock is released upon release of child locks associated therewith* as recited by applicants' claimed subject matter.

In view of the above, it is readily apparent that Chan *et al.* does not teach or suggest all limitations as recited in independent claims 1, 12, 20 and 21 (and the claims that depend from). Accordingly, it is respectfully requested that this rejection should be withdrawn.

**V. Rejection of Claims 2, 4, 22-24 and 26-30 Under 35 U.S.C. §103(a)**

Claims 2, 4, 22-24 and 26-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chan in view of Detlefs, *et al.* (Non Patent Literature "Lock-free reference counting). Withdrawal of this rejection is requested for at least the following reasons. Chan *et al.* or Detlefs alone or in combination fail to teach or suggest each and every limitation of applicant's claimed invention.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The subject claims depend from independent claims 1, 21 and 26. As discussed supra, Chan *et al.* does not teach or suggest each and every element of the subject invention as recited by independent claims 1, 21 and 26. Detlefs *et al.* fails to make up for the aforementioned deficiencies of Chan *et al.* Detlefs *et al.* relates to designing data structure implementations and the use of garbage collection to simplify the design of sequential implementation of data structures. Detlefs *et al.* fails to teach or suggest a lock manager that acquires a parent lock and a child lock on a resource of a database. Therefore, it is respectfully submitted that Chan *et al.*, and Detlefs *et al.*, alone or in combination, do not teach or suggest applicants' invention as recited in independent claims 1 and 21 (and claims 2, 4, 22, 23 and 24 that depend from).

Independent claim 26 recites *a computer-readable medium having stored thereon a data structure comprising a computer executable component that acquires parent locks and child locks on a database resource, the parent lock with a reference count of the child lock; the parent lock released upon the reference count attainment of a zero value.* Chan *et al.*, and Detlefs *et al.* alone or in combination fail to teach or suggest each and every limitation of applicants' claimed subject matter. Chan *et al.* relates to finer-grained dynamic allocation and de-allocation of locks in a system, while protecting against abnormal termination that may result in data integrity problems. As discussed supra, Chan *et al.* is silent regarding a lock manager that acquires a parent lock and a child lock on a resource of a database, and so does not teach *a computer executable component that acquires parent locks and child locks on a database resource, the parent lock with a reference count of the child lock* as recited by independent claim 26 of applicants' subject claims. Detlefs *et al.* does not compensate for the aforementioned deficiencies of Chan *et al.* Detlefs *et al.* is silent regarding parent locks and child locks, let alone *a computer executable component that acquires parent locks and child locks on a database resource, the parent lock with a reference count of the child lock* as recited by independent claim 26 of applicants' claimed subject matter.

Therefore, it is respectfully submitted that Chan *et al.* and Detlefs *et al.*, alone or in combination, do not teach or suggest applicants' invention as recited in independent claims 1, 21 and 26 (and the claims that depend from). Accordingly, withdrawal of this rejection is respectfully requested.

**CONCLUSION**

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP622US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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